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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

GILES, NICHOLAS G

ART UNIT PAPER NUMBER

2612

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/982,304

Applicant(s)

SAITO, SHINICHIRO

Examiner

Nicholas G. Giles

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 4-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9 and 10 is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☒ Claim(s) 2 and 4-8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION***Response to Arguments***

1. Applicant's arguments filed 11/28/2005 with respect to claim 1 have been fully considered but they are not persuasive. Applicant argues that Fujimara does not teach the use of carrier balance for gray filters. Fujimara was not used to teach the use of carrier balance for gray filters. Yoneyama was brought in to teach the use of gray filters and Yoneyama teaches carrier balance for gray filters (7:36-44). Applicant argues that the white filtered pixel signal is not used in the Fujimara reference. The applicant also points out several equations in Fujimara that are used in the interpolation of the white or green filtered pixels depending on which pixels are being used. Applicant argues that Fujimara teaches interpolation as a technique to obtain the green component of the image signal. Examiner agrees interpolation is used, however no where in the Fujimara reference can the examiner find where Fujimara teaches away from using a carrier balance technique to obtain the gray signal as disclosed in the Yoneyama reference. Applicant argues that the Yoneyama reference doesn't teach carrier balance used to ensure that the gray filter has substantially the same frequency characteristic as the other three primary color filters. Yoneyama does adjust the carrier balance in order to suppress moiré occurrence (7:36-44). Moiré occurrence is due to the difference in spatial frequency of the signal, and correcting the occurrence corrects the frequency problem. Therefore correcting the gain corrects the moiré occurrence, which corrects the frequency characteristic.

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2. Applicant's arguments, see page 9 last paragraph, filed 11/28/2005, with respect to claim 2 have been fully considered and are persuasive. The rejection of claim 2 has been withdrawn. Specifically the Bayer arrangement where gray filters replace specific green filters as claimed has not been found in the prior art.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimura et al. (U.S. Patent No. 6,900,838) in view of Yoneyama et al. (U.S. Patent No. 5,506,618).

Regarding claim 1, Fujimura et al. discloses:

A single plate type solid-state image pickup device having
primary-color type color filters (see column 1 lines 18-31).

Fujimura et al. goes on to disclose: a white filter is arranged in place of the green filter in some cases (See figure 1a and column 1 lines 18-31).

Fujimura et al. is silent with regard to using gray filters. Yoneyama et al. discloses: using gray filters instead of white filters (see figure 7b and column 7

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lines 36-45). As he describes, an advantage to doing so is that a balance between photodiodes in output charge quantities is maintained. For this reason, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made Fujimura's imaging device and replacing white filters with gray filters.

Yoneyama et al. further discloses:

Means for applying carrier balance so that said gray filters have substantially the same frequency characteristic as the other three primary color filters (the balance between colored and gray photodiodes is maintained by adjusting gains; see column 7 lines 36-45, Moiré occurrence is due to the difference in spatial frequency of the signal, and correcting the occurrence corrects the frequency problem. Therefore correcting the gain corrects the moiré occurrence, which corrects the frequency characteristic.).

An advantage to applying carrier balance is that moiré occurrence can be suppressed. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Fujimura's imaging device include applying carrier balance.

Allowable Subject Matter

5. Claims 9-10 are allowed.

Regarding claim 9, no prior art could be found that teaches or fairly suggests a solid-state image pickup device which red, blue, green, and gray

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filters are included where gray filters replace some green filters, where the transmissivity is set so that the integration value in the visible region is adjusted to be equal to that of the green filters.

Regarding claim 10, no prior art could be found that teaches or fairly suggests a solid-state image pickup device which red, blue, green, and gray filters are included where gray filters replace some green filters, where the transmissivity is set so that the integration value in the visible region is adjusted to be below to that of the green filters.

6. Claims 2 and 4-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 2, no prior art could be found that teaches or fairly suggests a solid-state image pickup device which red, blue, green filters are arranged in a Bayer arrangement, wherein gray filters are included and replace green filters that are adjacent to red filters in the horizontal direction or the gray filters replace green filters that are adjacent to blue filters in the horizontal direction.

Regarding claim 4, no prior art could be found that teaches or fairly suggests a solid-state image pickup device which red, blue, green, and gray filters are included where gray filters replace some green filters, where a white balance correction means is included and based off the carrier balance means.

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Regarding claims 5-7. Claims 5-7 are respectively dependent on claims 4-6 are therefore are allowed.

Regarding claim 8, no prior art could be found that teaches or fairly suggests a solid-state image pickup device which red, blue, green filters are arranged in a g-stripe arrangement, and gray filters replace every other green filter in each column of the g-stripe.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas G. Giles whose telephone number is

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(571) 272-2824. The examiner can normally be reached on Monday through Friday from 8am to 4:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc - Yen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NGG


NGOC-YEN VU
PRIMARY EXAMINER